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The Effect of Kinesiotapping and Stretching Exercise on Low Back Pain

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Abstract

Low back pain is a common condition associated with reduced physical function, poor mental health outcomes, and a reduced quality of life, and is one of the leading causes of disability worldwide. Low back pain can be treated with physiotherapy. Physiotherapy modalities that can be used to treat low back pain include kinesiotapping and stretching. Various physiotherapy modalities and techniques can be administered to low back pain sufferers, including kinesiotapping and stretching exercises. Kinesiotaping increases flexibility by stimulating stretching of the skin and muscle fascia. Kinesiotaping supports muscle movement, reduces pain, and improves fascial and joint alignment. Kinesiotaping normalizes movement function and nerve signals. These effects result in reduced pain in low back pain. Stretching is a general term used to describe any therapeutic maneuver designed to increase soft tissue extensibility with the aim of increasing flexibility and range of motion by lengthening (elongating) structures that have adaptively shortened and become hypomobile. This study aims to determine the effect of kinesiotaping and stretching on pain in low back pain. The research method used was a quasi-experimental study with a pretest-posttest one-group design, comparing the pretest and posttest. The study was conducted at the Mabbulossibatang Clinic and Sekolah Lansia Abdie Harapan. The study was conducted from April to October 2025.The results showed that a combination of kinesiotaping and stretching exercises was effective in reducing pain intensity in individuals with low back pain. The results showed that after undergoing a series of interventions, there was a significant improvement in the level of pain experienced by the subjects. Therefore, the combination of these two therapies can be considered a successful approach to managing low back pain.

***Keywords*:** Kinesiotapping; Pain; Low Back Pain.

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1. Introduction

Low back pain (LBP) is a common condition associated with reduced physical function, poor mental health outcomes, and decreased quality of life [1], and one of the leading causes of disability worldwide [2]. Low back pain merupakan kelainan kompleks yang dipengaruhi oleh faktor biologis, psikologis, dan sosial [3]. LBP is the leading cause of disability in both developed and developing countries, and sixth in terms of overall disease burden (life-year adjusted disability). Many people with low back pain do not seek treatment; A review of ten population-based studies (13,486 people) reported a prevalence of 58% seeking treatment [4]. LBP has become one of the most common musculoskeletal problems and has a major social and economic impact worldwide. According to a systematic review report by Rehabilitation Medicine in the journal The Journal of Orthopaedic & Sports Physical Therapy, trunk muscle activation exercises, including flexibility and stabilization exercises, are an important intervention for patients with acute and chronic LBP [5].

LBP is a symptom of the disease. Like other symptoms, such as headaches and dizziness, it can have many causes. The most common form of low back pain is non-specific low back pain. The term is used when the cause of the pathological pain cannot be determined [4]. LBP is a leading cause of disability worldwide [6]. According to the Corp non-pharmacological therapies are recommended for the treatment of low back pain throughout Europe [7].

Complaints of pain in the lower back region are often associated with stiffness of the paraspinal muscles and tension of the posterior chain muscles (hamstrings, gluteals, erector spinae), which causes decreased flexibility, postural compensation, and excessive load on the lumbosacral segment.

One increasingly used non-pharmacological clinical strategy is the application of elastic therapeutic tape, or kinesiotape. Meta-analyses and systematic reviews indicate that, although the evidence is mixed, several studies report that Kinesio Taping (KT) can reduce pain and improve function in patients with chronic non-specific low back pain. For example, a study by Ningrum & Setiawan (2024) indicated that KT combined with conventional therapy often demonstrated superior pain reduction [8].

On the other hand, structured stretching exercises have also been viewed as an important component of LBP rehabilitation programs. A narrative review of stretching mechanisms suggested that posterior chain muscle stretching can decrease muscle stiffness, increase soft tissue flexibility, and thus help reduce mechanical stress on the lumbar spine [9].

Some cases of LBP can be treated with various physiotherapy interventions based on the problematic findings. Various physiotherapy modalities and techniques can be given in cases of low back pain, including kinesiotapping and stretching exercises. Prabowo's research (2020) states that there is an influence of Kinesio Taping on increasing flexibility. Kinesiotapping will stimulate from stretching the skin and muscle fascia. Kinesiotapping will support muscle movement, reduce pain, improve the aligment of the fascia and joints. Kinesio Taping normalizes the function of movement and nerve signals. This effect causes an increase in muscle flexibility. Stretching is a general term used to describe any therapeutic maneuver designed to increase the

extensibility of soft tissues with the aim of increasing flexibility and ROM by lengthening (elongating) structures that adaptively shorten and become hypomobility [10].

Based on these findings, it has been argued that the combination of kinesiotaping and stretching exercises can provide a synergistic effect: kinesiotaping prepares soft tissues by reducing tension and improving circulation, while stretching exercises promote muscle flexibility and tissue relaxation. However, to date, there has been limited research directly testing the effectiveness of this combination of interventions in the LBP population in a clinical setting. Therefore, this study aimed to evaluate the effectiveness of combined kinesiotaping and stretching exercises in reducing pain intensity in individuals with LBP.

2. Material and Method

2.1. Description of the Study Area

The study was conducted at Mabbulossibatang Clinic and Sekolah Lansia Abdie Harapan, Makassar, Indonesia in April to October 2025.

The interventions provided were kinesiotapping and stretching exercises for patients with lower back pain.

2.2. Population and Sample

This study is a pre-experimental study with a single-group pretest-posttest design. The researcher administered a pre-test of pain to 20 participants who were to receive treatment. The researchers subsequently administered therapy through Kinesiotaping and stretching exercises. Subsequent to treatment, the researcher administered a post-test to assess pain levels.

2.3. Collecting Data and Procedure Intervention

The data collection procedure was carried out through several systematic stages. The first stage was a pre-test to assess pain levels in 30 respondents diagnosed with low back pain (LBP). Pain was measured using a Visual Analog Scale (VAS) as a baseline before the intervention.

In the intervention phase, participants received a combination of kinesiotaping and stretching exercises. Kinesiotaping was applied to the lumbar region using a paraspinal muscle facilitation technique, with an application pattern based on the principles of elastic therapeutic taping. After applying the kinesiotape, participants performed a series of stretching exercises targeting the paraspinal muscles and posterior chain muscle groups, including the hamstrings and gluteal muscles, for 15–20 seconds per repetition. The intervention was administered twice per week for four weeks.

After all intervention sessions were completed, a post-test was administered to re-measure pain levels using the same instrument. A comparison of pre- and post-test results was used to determine the effectiveness of the combination of kinesiotaping and stretching exercises in reducing pain in low back pain sufferers.

2.4. Ethical consideration and clearance

Ethical approval for this study was obtained from The Ethics Committee, Health Polytechnics of Makassar, Department of Physiotherapy, Makassar, Indonesia.

3. Result

This study uses a type of quasi-experimental research using a pre-test post-test one-group design. This research was conducted in April – October 2025 in Mabbulossibatang Clinic and Sekolah Lansia Abdie Harapan Makassar. Pain levels were measured before and after the intervention. The intervention was administered twice a week for four weeks. In the final session, post-test measurements were conducted to evaluate the changes in pain levels.

Table 1: Respondents by gender

Gender		**n**	**%**
a.	Man	5	25,0
b.	Woman	15	75,0
Total		20	100,0

According to Table 1, the study comprised 20 respondents. The bulk of responses were female, with 15 individuals (75.0%), while 5 were male (25.0%). This data reveals that most study participants were female.

Table 2: Respondents by age group

Age group		**n**	**%**
a.	46-59 tahun	6	30,0
b.	60 tahun keatas	14	70,0
Total		20	100,0

Based on Table 2, the number of respondents in this study was 20 people, divided into two age groups. Six respondents (30.0%) were in the 46–59 age group, while 14 respondents (70.0%) were in the 60+ age group. This indicates that most respondents were in the elderly age group.

Table 3: Data Normality Test

Saphiro-Wilk	n	α
Pre test pain score	20	0,001
Post test pain score	20	0,090

Based on Table 3, the results of the normality test using the Shapiro–Wilk method show that the pre-test pain

score data has a significance value of p = 0.001, which means p < 0.05, so the data is not normally distributed. Meanwhile, the post-test pain score has a significance value of p = 0.090, or p > 0.05, so the data is normally distributed. Thus, it can be concluded that only the post-test data meets the assumption of normality, while the pre-test data does not. Next, the data will be analyzed using non-parametric tests.

Table 4: Pain pre test and post test intervention with kinesiotapping and stretching exercise

score	n	Mean	SD	p-value
Pre test pain	20	4,40	1,273	0,000*
Post test pain	20	2,65	1,182	
Pain difference	20	1,75	0,716	

Description: * Wilcoxon test

Based on Table 4, the average pain score of respondents before the intervention was 4.40 ± 1.273, while after the intervention the average pain score decreased to 2.65 ± 1.182. The difference in pain score reduction was 1.75 ± 0.716. The results of the statistical test using the Wilcoxon test showed a p value = 0.000 (p < 0.05), which means there was a significant difference between pain scores before and after the intervention. Thus, the intervention provided was proven effective in reducing pain intensity in respondents.

4. Discussion

The results of the intervention effectiveness test (Table 4) showed a significant reduction in pain scores. The average pain score before the intervention was 4.40, decreasing to 2.65 after the intervention, with a difference of 1.75. A p-value of 0.000 (p < 0.05) indicates that the intervention had a significant effect in reducing pain intensity. These findings strengthen the evidence that the exercise or therapy provided can reduce muscle spasms, improve circulation, enhance neuromuscular control, and reduce the inflammatory response that plays a role in the emergence of low back pain.

Several recent studies support the effectiveness of kinesiotaping in low back pain. Mohamed and his colleagues (2023) reported that the addition of Kinesio taping to conventional physiotherapy provides greater short-term pain improvement in patients with chronic low back pain than physiotherapy alone [11]. Another study by Peñalver-Barrios and his colleagues (2021) in a randomized clinical trial showed that the application of kinesiotaping targeted at chronic low back pain patients was able to significantly reduce pain intensity [12]. More recent systematic reviews and meta-analyses have also concluded that kinesiotaping can improve posture, balance, and reduce pain in low back pain, especially when used as an adjunct to therapeutic exercises [13].

In terms of exercise, the latest evidence also supports the role of stretching and stabilization exercises in reducing low back pain. Plandowska and his colleagues (2024) reported that an 8-week program of active hamstring stretching combined with core stabilization exercises significantly reduced musculoskeletal pain and complaints in non-specific low back pain in young adults [14]. In addition, Wada and his colleagues (2024) through a review of several journals concluded that the combination of stretching and core stability exercises is

consistently effective in reducing pain and increasing functional activity in patients with low back pain [15]. The combination of kinesiotaping and exercise has also been studied in several recent studies. Blanco-Giménez and his colleagues (2024) showed that a 12-week exercise program combined with kinesiotaping or manual therapy was able to reduce pain and affect lumbar muscle activity in chronic low back pain [16].

The results of this study indicate that the combined therapy of kinesiotaping and stretching exercises has been proven effective in reducing pain intensity in individuals with low back pain (LBP). The results of this study are in line with research that states that the combined therapy of kinesiotaping and stretching exercises has been proven effective in reducing pain intensity in individuals with low back pain (LBP) (meta-analysis shows that taping therapy combined with physiotherapy or exercise is better in reducing pain and disability than physiotherapy alone [17]. This research is also in line with research which states that the addition of kinesiotapping has a better effect in reducing lower back pain compared to the group that was not given kinesiotapping [18]. This research is also in line with research which states that stretching reduces pain in low back pain sufferers [19].

Kinesiotaping is thought to exert effects on sensorimotor control through stimulation of cutaneous mechanoreceptors, which then increases somatosensory afference and facilitates neuromuscular responses [20]. Mechanistically, kinesiotaping may work through sensory modulation of the skin and soft tissues, which then reduces pain signal transmission through a "gate control" mechanism, as well as improving lumbar stabilizer muscle activity and muscle coordination. A 2024 study showed that kinesiotaping also increased multifidus and rectus abdominis muscle activity when combined with physical exercise [16].

Meanwhile, stretching exercises play a crucial role in increasing the flexibility of the paraspinal and posterior chain muscles, which commonly experience tightness in low back pain (LBP). These exercises facilitate the lengthening of muscle tissue and fascia by increasing muscle compliance and decreasing muscle stiffness, thereby improving range of motion and reducing soft tissue restrictions [21]. Stretching exercises help reduce muscle spasms, improve the balance of strength and flexibility that is often disturbed in people with low back pain. This is consistent with evidence that exercise programs that include stretching and mobility can improve pain outcomes and functional limitations [22].The synergistic effect between kinesiotaping and stretching exercises explains why their combination produces significant results. Kinesiotaping helps prepare muscles and soft tissues by reducing tension and inflammation, thus optimizing the stretching response without causing pain reactivation. These two interventions work simultaneously on the neuromuscular, vascular, and sensory systems associated with the pathophysiology of low back pain. With these mechanisms, the pain reduction in the combination group can be explained physiologically and supports the use of kinesiotaping and stretching as a safe, easy-to-implement, and effective complementary intervention in physiotherapy rehabilitation. Thus, the results of this study support that the combination of kinesiotaping and stretching exercise can be used as part of a non-pharmacological intervention strategy for patients with low back pain. However, it is recommended that further studies use more robust designs (e.g. RCTs with control groups), involve larger sample sizes, and assess advanced functional outcomes (such as mobility, lumbar muscle endurance, and quality of life) to more clearly explore the mechanisms of long-term effects and benefits.

5. Limitation of Study

This study has several limitations, including a relatively small sample size (n=20), which restricts the generalizability of the findings, and a pre–post study design without a control group, which allows the intervention effects to be influenced by external factors such as physical activity or the use of analgesics. Additionally, pain assessment relied on subjective measures, which may introduce response bias. Moreover, the short duration of the intervention does not adequately reflect the long-term effects of kinesiotaping and stretching exercises on low back pain, and the absence of objective measurements such as range of motion or musculoskeletal function limits the comprehensiveness of interpreting the physiological mechanisms underlying the intervention.

6. Conclusion

The results of this study demonstrate that the combined application of kinesiotaping and stretching exercise is effective in reducing pain intensity among individuals with low back pain. Following the intervention period, participants experienced a significant improvement in their reported pain levels, indicating that the synergistic effects of both modalities provide meaningful therapeutic benefits. Therefore, this combined approach can be considered a successful and clinically relevant strategy for managing low back pain, offering a feasible option within physiotherapy rehabilitation programs.

7. Abbreviation

LBP: Low Back Pain

8. Competing interest

The authors declare that they have no competing interest

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